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Agricultural
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Conservation
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Research

Research
Project
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Conservation Systems Research

Response of Soil and Crops (Cotton and Corn) to a Deep Tillage Shank Attachment

RESEARCH PROJECT DESCRIPTION NO. 48



Pulling deep tillage shank attachment through soil. *Sub-surface is loosened with minimal disturbance to surface soil and residue cover.*

Researchers

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The Challenge

Many soils of the southeastern USA have naturally-occurring, root-impeding layers that can have negative effects on crop growth. The problem is often magnified when farmers convert to conservation tillage systems, in which tillage is minimized. To remedy this problem, many farmers use in-row, annual deep tillage. This can loosen the soil to the depth of the tillage; however, it can greatly increase soil compaction below that zone. The tillage operation can smear the soil over pores and completely prevent roots and water from penetrating deeper into the soil. An attachment has been developed to reduce or eliminate the problem, but very little is known about how it performs under field conditions.

The Experiment

A three-year experiment at the Alabama Agricultural Experiment Station's E.V. Smith Research Center, near Milstead, will:

- Evaluate corn and cotton response to a deep tillage shank attachment.
- Evaluate the soil and moisture response to a deep tillage shank attachment.
- Determine energy requirements associated with a deep tillage shank attachment.

The experiment will include two fields, one of continuous corn and one of continuous cotton. Each field will have two deep tillage treatments (a deep tillage implement with and without a shank attachment), and two tillage depths.

Plant and soil samples will be collected throughout the seasons to monitor plant height, crop yield, soil cone index before and after each tillage, soil bulk density, soil hydraulic conductivity, tillage forces, and depth of tillage.



Cut-away photo shows the channel created by the shank attachment when pulled through the soil.